

SEQUENCE LISTING

<110> Cases, Sylvaine
Stone, Scot
Zhou, Ping
Farese, Robert V.
Chi-Liang Eric Yen

<120> MONO- AND DIACYGLYCEROL ACYLTRANSFERASES AND METHODS OF USE THEREOF

<130> UCAL240CIP

<140> Unassigned
<141> 2002-01-14

<150> 60/271,307
<151> 2001-02-23

<150> 09/794,715
<151> 2001-02-26

<160> 18

<170> FastSEQ for Windows Version 4.0

<210> 1
<211> 1231
<212> DNA
<213> Homo sapiens

<400> 1

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caataggtcc aaggtggaaa agcagctaca ggtcatctca gtgctccagt	240
cttccttgta ctgggagtgg cctgcagtgc catcctcatg tacatattct	300
ctggctcatc gctgtgtctt acttacttg gctgggttt gactggaaaca	360
agggtggcagg aggtcacagt gggtccgaaa ctgggctgtg tggcgctact	420
cttcccatc cagctggta agacacacaa cctgctgacc accaggaact	480
ataccacccc catgttatca tgggcctggg tgccttctgc aacttcagca	540
agaagtgagc aagaagttcc caggcatacg gccttacactg gctacactgg	600
ccgaatgcct gtgttggaggg agtacactgat gtctggaggt atctgcctg	660
caccatagac tatttgcattt caaagaatgg gagtgccat gctatcatca	720
gggtgcggct gagtctctga gctccatgcc tggcaagaat gcagtcaccc	780
caaggcctt gtgaaactgg ccctgcgtca tggagctgac ctgggttccca	840
tggagagaat gaagtgtaca agcaggtgat cttcgaggag ggctctggg	900
ccagaagaag ttccagaaat acattggttt cgccccatgc atctccatg	960
cttctccctc gacacctggg ggctggtgcc ctactccaag cccatcacca	1020
agagccatc accatcccc a gctggagca cccaa cccag caagacatcg	1080
accatgtac atggaggccc tggtaagct cttcgacaa cacaagacca	1140

caccatgtac atggaggccc tggtaagct cttcgacaag cacaagacca agttcggcct 1140
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<210> 2
<211> 388
<212> PRT
<213> Homo sapiens

<400> 2
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Gln Ala Glu Ala Asp Arg Ser Gln Arg Ser His Gly Gly Pro Ala Leu
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Ser Arg Glu Gly Ser Gly Arg Trp Gly Thr Gly Ser Ser Ile Leu Ser
35 40 45
Ala Leu Gln Asp Leu Phe Ser Val Thr Trp Leu Asn Arg Ser Lys Val
50 55 60
Glu Lys Gln Leu Gln Val Ile Ser Val Leu Gln Trp Val Leu Ser Phe
65 70 75 80
Leu Val Leu Gly Val Ala Cys Ser Ala Ile Leu Met Tyr Ile Phe Cys
85 90 95
Thr Asp Cys Trp Leu Ile Ala Val Leu Tyr Phe Thr Trp Leu Val Phe
100 105 110
Asp Trp Asn Thr Pro Lys Lys Gly Gly Arg Arg Ser Gln Trp Val Arg
115 120 125
Asn Trp Ala Val Trp Arg Tyr Phe Arg Asp Tyr Phe Pro Ile Gln Leu
130 135 140
Val Lys Thr His Asn Leu Leu Thr Thr Arg Asn Tyr Ile Phe Gly Tyr
145 150 155 160
His Pro His Gly Ile Met Gly Leu Gly Ala Phe Cys Asn Phe Ser Thr
165 170 175
Glu Ala Thr Glu Val Ser Lys Lys Phe Pro Gly Ile Arg Pro Tyr Leu
180 185 190
Ala Thr Leu Ala Gly Asn Phe Arg Met Pro Val Leu Arg Glu Tyr Leu
195 200 205
Met Ser Gly Gly Ile Cys Pro Val Ser Arg Asp Thr Ile Asp Tyr Leu
210 215 220
Leu Ser Lys Asn Gly Ser Gly Asn Ala Ile Ile Val Val Gly Gly
225 230 235 240
Ala Ala Glu Ser Leu Ser Ser Met Pro Gly Lys Asn Ala Val Thr Leu
245 250 255
Arg Asn Arg Lys Gly Phe Val Lys Leu Ala Leu Arg His Gly Ala Asp
260 265 270
Leu Val Pro Ile Tyr Ser Phe Gly Glu Asn Glu Val Tyr Lys Gln Val
275 280 285
Ile Phe Glu Gly Ser Trp Gly Arg Trp Val Gln Lys Lys Phe Gln
290 295 300
Lys Tyr Ile Gly Phe Ala Pro Cys Ile Phe His Gly Arg Gly Leu Phe
305 310 315 320
Ser Ser Asp Thr Trp Gly Leu Val Pro Tyr Ser Lys Pro Ile Thr Thr

	325	330	335
Val Val Gly Glu Pro Ile Thr Ile Pro Lys Leu Glu His Pro Thr Gln			
340	345	350	
Gln Asp Ile Asp Leu Tyr His Thr Met Tyr Met Glu Ala Leu Val Lys			
355	360	365	
Leu Phe Asp Lys His Lys Thr Lys Phe Gly Leu Pro Glu Thr Glu Val			
370	375	380	
Leu Glu Val Asn			
385			

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 <212> DNA
 <213> Mus musculus

<220>
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 <222> (1)...(1167)
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ggcactggct ccagcatcct ctcagccctc caagacatct tctctgtcac ctggctcaac	180		
agatcyaagg tggaaaaaaca gctgcaggctc atctcagttac tacaatgggt cctatccctc	240		
ctgggtctag gagtggccctg cagtgtcatc ctcatgtaca ccttctgcac agactgctgg	300		
ctgatagctg tgctctactt cacctggctg gcatttgact ggaacacgccc caagaaaggt	360		
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caccccccattt gcatcatggg cctgggtgcc ttctgttaact tcagcacaga ggctactgaa	540		
gtcagcaaga agtttcttgg cataaggccc tatttggcta cgttggcygg taacttccgg	600		
atgcctgtgc ttgcgtgatca cctgatgtct ggaggcatct gccctgtcaa ccgagacacc	660		
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gcagctgagt ccctgagctc catgcctggc aagaacgcag tcaccctgaa gaaccgcaaa	780		
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gagaatgagg tatacaagca ggtgatcttt gaggagggtt cctggggccg atgggtccag	900		
aagaagtcc agaagtataat tggtttgcgc ccctgcatct tccatggccg aggccctttc	960		
tcctctgaca cctggggctt ggtgcctac tccaagccca tcaccaccgt cgtgggggag	1020		
cccatcaactg tcccccaagct ggagcaccccg acccagaaag acatcgacct gtaccatgcc	1080		
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gagactgagg tgctggaggt gaactga	1167		

<210> 4
 <211> 387
 <212> PRT
 <213> Mus musculus

<400> 4
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 1 5 10 15
 Arg Ala Glu Leu Pro Ala Ala Lys Asn Lys Asn Lys Gly Ser Ala Leu

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Ser Arg Glu Gly Ser Gly Arg Trp Gly Thr Gly Ser Ser Ile Leu Ser			
35	40	45	
Ala Leu Gln Asp Ile Phe Ser Val Thr Trp Leu Asn Arg Ser Lys Val			
50	55	60	
Glu Lys Gln Leu Gln Val Ile Ser Val Leu Gln Trp Val Leu Ser Phe			
65	70	75	80
Leu Val Leu Gly Val Ala Cys Ser Val Ile Leu Met Tyr Thr Phe Cys			
85	90	95	
Thr Asp Cys Trp Leu Ile Ala Val Leu Tyr Phe Thr Trp Leu Ala Phe			
100	105	110	
Asp Trp Asn Thr Pro Lys Lys Gly Gly Arg Arg Ser Gln Trp Val Arg			
115	120	125	
Asn Trp Ala Val Trp Arg Tyr Phe Arg Asp Tyr Phe Pro Ile Gln Leu			
130	135	140	
Val Lys Thr His Asn Leu Leu Thr Thr Arg Asn Tyr Ile Phe Gly Tyr			
145	150	155	160
His Pro His Gly Ile Met Gly Leu Gly Ala Phe Cys Asn Phe Ser Thr			
165	170	175	
Glu Ala Thr Glu Val Ser Lys Lys Phe Pro Gly Ile Arg Pro Tyr Leu			
180	185	190	
Ala Thr Leu Ala Gly Asn Phe Arg Met Pro Val Leu Arg Glu Tyr Leu			
195	200	205	
Met Ser Gly Gly Ile Cys Leu Val Asn Arg Asp Thr Ile Asp Tyr Leu			
210	215	220	
Leu Ser Lys Asn Gly Ser Gly Asn Ala Ile Ile Val Val Gly Gly			
225	230	235	240
Ala Ala Glu Ser Leu Ser Ser Met Pro Gly Lys Asn Ala Val Thr Leu			
245	250	255	
Lys Asn Arg Lys Gly Phe Val Lys Leu Ala Leu Arg His Gly Ala Asp			
260	265	270	
Leu Val Pro Thr Tyr Ser Phe Gly Glu Asn Glu Val Tyr Lys Gln Val			
275	280	285	
Ile Phe Glu Glu Gly Ser Trp Gly Arg Trp Val Lys Lys Phe Gln Lys			
290	295	300	
Tyr Ile Gly Phe Ala Pro Cys Ile Phe His Gly Arg Gly Leu Phe Ser			
305	310	315	320
Ser Asp Thr Trp Gly Leu Val Pro Tyr Ser Lys Pro Ile Thr Thr Val			
325	330	335	
Val Gly Glu Pro Ile Thr Val Pro Lys Leu Glu His Pro Thr Gln Lys			
340	345	350	
Asp Ile Asp Leu Tyr His Ala Met Tyr Met Glu Ala Leu Val Lys Leu			
355	360	365	
Phe Asp Asn His Lys Thr Lys Phe Gly Leu Pro Glu Thr Glu Val Leu			
370	375	380	
Glu Val Asn			
385			

<210> 5

<211> 1008

<212> DNA

<213> Mus musculus

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atgctggtcg tgcataacta ttggccctt tacatccat atctggctcg gttttactat 180
gactggagaa ccccgagca aggaggcaga agatgaaact gggccaaag ctggccgtg 240
tggaaagtatt ttaaggagta ttcccaatc tgcattgtca aaacgcagga ttggatccg 300
ggtcacaatt atatattgg gttcacccat catggatat tgcctgg agccttgaa 360
aattttgtt caaaaataactc ggacttcaag aagctatttccatggcttac atcgatctc 420
cacgtggcca agatctggtt ctgtttcccg ttgttccgag aatatctgtat gatggacggg 480
ccggtttcag tgcataagga gagttgtct catgtgcga gcaaggatgg aggtggcaat 540
gtctcaatca ttgtcctcgag ggtgcaaaag gaggcgtgg aggctcaccc aggaacattc 600
accctgtgca tccgcccagcg caaagggttt tttaagatgg ccttgcacca ttgtgcccagt 660
ttggttccag tattttctt ttgtgaaaat gatctatata agcaaaattaa caacccaaa 720
ggctcctggc tacgaactat acaagacgca atgtatgatt caatgggagt agccttgcca 780
ctgatatatg ccagaggaat ttccagcac tactttggca taatggcccta tcggaagctg 840
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cagattgaag agctgcataca gacataccta gaggagctaa agaaactatt caatgaacac 960
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<210> 6

<211> 335

<212> PRT

<213> Mus musculus

<400> 6
Met Met Val Glu Phe Ala Pro Leu Asn Thr Pro Leu Ala Arg Cys Leu
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Gln Thr Ala Ala Val Leu Gln Trp Val Leu Ser Phe Leu Leu Val
20 25 30
Gln Val Cys Ile Gly Ile Met Val Met Leu Val Leu Tyr Asn Tyr Trp
35 40 45
Phe Leu Tyr Ile Pro Tyr Leu Val Trp Phe Tyr Tyr Asp Trp Arg Thr
50 55 60
Pro Glu Gln Gly Gly Arg Arg Trp Asn Trp Val Gln Ser Trp Pro Val
65 70 75 80
Trp Lys Tyr Phe Lys Glu Tyr Phe Pro Ile Cys Leu Val Lys Thr Gln
85 90 95
Asp Leu Asp Pro Gly His Asn Tyr Ile Phe Gly Phe His Pro His Gly
100 105 110
Ile Phe Val Pro Gly Ala Phe Gly Asn Phe Cys Thr Lys Tyr Ser Asp
115 120 125
Phe Lys Lys Leu Phe Pro Gly Phe Thr Ser Tyr Leu His Val Ala Lys
130 135 140
Ile Trp Phe Cys Phe Pro Leu Phe Arg Glu Tyr Leu Met Ser Asn Gly
145 150 155 160
Pro Val Ser Val Ser Lys Glu Ser Leu Ser His Val Leu Ser Lys Asp
165 170 175
Gly Gly Gly Asn Val Ser Ile Ile Val Leu Gly Gly Ala Lys Glu Ala
180 185 190

Leu Glu Ala His Pro Gly Thr Phe Thr Leu Cys Ile Arg Gln Arg Lys
 195 200 205
 Gly Phe Val Lys Met Ala Leu Thr His Gly Ala Ser Leu Val Pro Val
 210 215 220
 Phe Ser Phe Gly Glu Asn Asp Leu Tyr Lys Gln Ile Asn Asn Pro Lys
 225 230 235 240
 Gly Ser Trp Leu Arg Thr Ile Gln Asp Ala Met Tyr Asp Ser Met Gly
 245 250 255
 Val Ala Leu Pro Leu Ile Tyr Ala Arg Gly Ile Phe Gln His Tyr Phe
 260 265 270
 Gly Ile Met Pro Tyr Arg Lys Leu Ile Tyr Thr Val Val Gly Arg Pro
 275 280 285
 Ile Pro Val Gln Gln Ile Leu Asn Pro Thr Ser Glu Gln Ile Glu Glu
 290 295 300
 Leu His Gln Thr Tyr Leu Glu Glu Leu Lys Lys Leu Phe Asn Glu His
 305 310 315 320
 Lys Gly Lys Tyr Gly Ile Pro Glu His Glu Thr Leu Val Phe Lys
 325 330 335

<210> 7
 <211> 1129
 <212> DNA
 <213> Homo sapiens

<400> 7

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gtcctttctt ttcttacagg gccgatgtcc attggaatca	ctgtgtatgt gatcatacac	180
aactatttgt tcctttacat cccttatttg atgtggctt	actttgactg gcatacccc	240
gaggcaggag	gcaggagatc cagctggatc aaaaatgg	300
gactattttc caattcatct tatcaaaaact	caagatttg atccaaatgtca	360
tttgggttcc accccatgg aataatggca	gttggagcct ttgggaattt ttctgtaaat	420
tattctgact tcaaggaccc	gttccctggc ttacttcat atttcacgt	480
tgggtctgg	gctgcactt	540
aagaaaatgt	gtcctgtctt tcgagaatat gtgatgagtg	600
cttgggggtg	ttgggctgg ttcagttcc	660
caaaaagaatc	actggatgct catcctggaa agttcactct	720
cagcggaaag	gtttgtttaa aattgcttt acccatggcg	780
tctttgggtg	cctctctggt cccagtgg	840
actgttcaga	aaaatgaact gttaaacaa actgacaacc	900
ggagtttttc	ctgaaggatc atggattaga	960
ggccgccccga	actgataatg acctataatgg aagccatcca	1020
tccctgttcg	caacttggtt tgcccctgtt tcatgccagg	1080
catcagaccc	agtacaattt tggcctaattg	1129
atatggagga	acccatggc aggagcagat tgaggagtt	
attccagagc	acttaggaaa ttgtttgagg aacacaaagg	
acgagactct	aaagtatggc tggacttact ataaaaaaa	
aaaaataaat	taataaggca taaagaagga	
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<210> 8
 <211> 334
 <212> PRT
 <213> Homo sapiens

<400> 8

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 20 25 30
 Met Ser Ile Gly Ile Thr Val Met Leu Ile Ile His Asn Tyr Leu Phe
 35 40 45
 Leu Tyr Ile Pro Tyr Leu Met Trp Leu Tyr Phe Asp Trp His Thr Pro
 50 55 60
 Glu Arg Gly Gly Arg Arg Ser Ser Trp Ile Lys Asn Trp Thr Leu Trp
 65 70 75 80
 Lys His Phe Lys Asp Tyr Phe Pro Ile His Leu Ile Lys Thr Gln Asp
 85 90 95
 Leu Asp Pro Ser His Asn Tyr Ile Phe Gly Phe His Pro His Gly Ile
 100 105 110
 Met Ala Val Gly Ala Phe Gly Asn Phe Ser Val Asn Tyr Ser Asp Phe
 115 120 125
 Lys Asp Leu Phe Pro Gly Phe Thr Ser Tyr Leu His Val Leu Pro Leu
 130 135 140
 Trp Phe Trp Cys Pro Val Phe Arg Glu Tyr Val Met Ser Val Gly Leu
 145 150 155 160
 Val Ser Val Ser Lys Ser Val Ser Tyr Met Val Ser Lys Glu Gly
 165 170 175
 Gly Gly Asn Ile Ser Val Ile Val Leu Gly Gly Ala Lys Glu Ser Leu
 180 185 190
 Asp Ala His Pro Gly Lys Phe Thr Leu Phe Ile Arg Gln Arg Lys Gly
 195 200 205
 Phe Val Lys Ile Ala Leu Thr His Gly Ala Ser Leu Val Pro Val Val
 210 215 220
 Ser Phe Gly Glu Asn Glu Leu Phe Lys Gln Thr Asp Asn Pro Glu Gly
 225 230 235 240
 Ser Trp Ile Arg Thr Val Gln Asn Lys Leu Gln Lys Ile Met Gly Phe
 245 250 255
 Ala Leu Pro Leu Phe His Ala Arg Gly Val Phe Gln Tyr Asn Phe Gly
 260 265 270
 Leu Met Thr Tyr Arg Lys Ala Ile His Thr Val Val Gly Arg Pro Ile
 275 280 285
 Pro Val Arg Gln Thr Leu Asn Pro Thr Gln Glu Gln Ile Glu Glu Leu
 290 295 300
 His Gln Thr Tyr Met Glu Glu Leu Arg Lys Leu Phe Glu Glu His Lys
 305 310 315 320
 Gly Lys Tyr Gly Ile Pro Glu His Glu Thr Leu Val Leu Lys
 325 330

<210> 9
 <211> 435
 <212> DNA
 <213> Mus musculus

 <220>
 <221> misc_feature
 <222> (1) ... (435)

<223> n = A, T, C or G

<400> 9

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tgttaatttg cctattgttc acacccttgt gggcgctacc aacagttac tttgtctggt
tacttctcga ctggaagact ccagataaag gtggcaggcg ttcagactgg gtacggaaact
ggaatgtctg gaaccacatc agggactatt tccccattac aatcctgaag actaaggacc
tgtcaccttc agagaactac atcatggggg tccaccccat nngtctcctg accttcggtg
ccttctgcaa cttctgcact gaggccacag gcttctcgaa gaccttccca ggcatcactc
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<210> 10

<211> 229

<212> PRT

<213> Mus musculus

<400> 10

5210> 11

<211> 1240

<212> DNA

<213> Homo sapiens

<400> 11

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gttttcaat	ggatcccagt	ctatatattt	ttagtttga	tcttgcagcc	attgttcgtc	180
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gactggaaga	ccccagagcg	aggtggcagg	cgttcggct	ggtaaggaa	ctggtgtgtc	300
tggaccacaca	tcagggacta	tttcccatt	acgatcctga	agacaaagga	cctatcacct	360
gagcacaact	acctcatggg	ggttcacccc	catggcctcc	tgaccttgg	cgcctctgc	420
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gtgggcattt	tagtgggagg	tgtgggtgag	gcccctgcaaa	gtgtgccttca	caccaccacc	660
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gtcccttcat	attcctttgg	tgagaacgaa	gttttcaatc	aggagacctt	ccctgagggc	780
acgtggtaa	ggttgc当地	aaaaaccttc	caggacacat	tcaaaaaaaat	cctggacta	840
aatttctgta	ccttccatgg	ccggggcttc	actcgccggat	cctggggctt	cctgccttcc	900
aatcggccca	ttaccactgt	ttttgggaa	ccccttccaa	ttcccaggat	taagaggcca	960
aaccagaaga	cagtagacaa	gtatcacgca	ctctacatca	gtgc当地	caagctctt	1020
gaccaacaca	aagttgaata	tggcctccct	gagacccaag	agctgacaat	tacataacag	1080
gagccacatt	ccccattgtat	caaccccaa	agccatgagg	gatccaagta	gagccacaga	1140
aaaagaagaa	ttccaggaga	gggaaagatc	gtaaggatga	gagaggagac	catccaagcc	1200
agaaaattatt	taataaatca	gagttcttagc	aatagagtcc			1240

<210> 12

<211> 335

<212> PRT

<213> Homo sapiens

<400> 12

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															20
															25
															30
Gln	Pro	Leu	Phe	Val	Tyr	Leu	Leu	Phe	Thr	Ser	Leu	Trp	Pro	Leu	Pro
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															40
															45
Val	Leu	Tyr	Phe	Ala	Trp	Leu	Phe	Leu	Asp	Trp	Lys	Thr	Pro	Glu	Arg
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															55
															60
Gly	Gly	Arg	Arg	Ser	Ala	Trp	Val	Arg	Asn	Trp	Cys	Val	Trp	Thr	His
															65
															70
															75
															80
Ile	Arg	Asp	Tyr	Phe	Pro	Ile	Thr	Ile	Leu	Lys	Thr	Lys	Asp	Leu	Ser
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															90
															95
Pro	Glu	His	Asn	Tyr	Leu	Met	Gly	Val	His	Pro	His	Gly	Leu	Leu	Thr
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															105
															110
Phe	Gly	Ala	Phe	Cys	Asn	Phe	Cys	Thr	Glu	Ala	Thr	Gly	Phe	Ser	Lys
															115
															120
															125
Thr	Phe	Pro	Gly	Ile	Thr	Pro	His	Leu	Ala	Thr	Leu	Ser	Trp	Phe	Phe
															130
															135
															140
Lys	Ile	Pro	Phe	Val	Arg	Glu	Tyr	Leu	Met	Ala	Lys	Gly	Val	Cys	Ser

145	150	155	160												
Val	Ser	Gln	Pro	Ala	Ile	Asn	Tyr	Leu	Leu	Ser	His	Gly	Thr	Gly	Asn
165	170	175													
Leu	Val	Gly	Ile	Val	Val	Gly	Gly	Val	Gly	Glu	Ala	Leu	Gln	Ser	Val
180	185	190													
Pro	Asn	Thr	Thr	Thr	Leu	Ile	Leu	Gln	Lys	Arg	Lys	Gly	Phe	Val	Arg
195	200	205													
Thr	Ala	Leu	Gln	His	Gly	Ala	Tyr	Leu	Val	Pro	Ser	Tyr	Ser	Phe	Gly
210	215	220													
Glu	Asn	Glu	Val	Phe	Asn	Gln	Glu	Thr	Phe	Pro	Glu	Gly	Thr	Trp	Leu
225	230	235	240												
Arg	Leu	Phe	Gln	Lys	Thr	Phe	Gln	Asp	Thr	Phe	Lys	Lys	Ile	Leu	Gly
245	250	255													
Leu	Asn	Phe	Cys	Thr	Phe	His	Gly	Arg	Gly	Phe	Thr	Arg	Gly	Ser	Trp
260	265	270													
Gly	Phe	Leu	Pro	Phe	Asn	Arg	Pro	Ile	Thr	Thr	Val	Val	Gly	Glu	Pro
275	280	285													
Leu	Pro	Ile	Pro	Arg	Ile	Lys	Arg	Pro	Asn	Gln	Lys	Thr	Val	Asp	Lys
290	295	300													
Tyr	His	Ala	Leu	Tyr	Ile	Ser	Ala	Leu	Arg	Lys	Leu	Phe	Asp	Gln	His
305	310	315	320												
Lys	Val	Glu	Tyr	Gly	Leu	Pro	Glu	Thr	Gln	Glu	Leu	Thr	Ile	Thr	
325	330	335													

<210> 13

<211> 1872

<212> DNA

<213> Homo sapiens

<400> 13

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<210> 14
<211> 333
<212> PRT
<213> Homo sapiens

<400> 14
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35 40 45
Thr Val Leu Ile Leu Thr Trp Leu Ala Phe Asp Trp Lys Thr Pro Gln
50 55 60
Arg Gly Gly Arg Arg Phe Thr Cys Val Arg His Trp Arg Leu Trp Lys
65 70 75 80
His Tyr Ser Asp Tyr Phe Pro Leu Lys Leu Leu Lys Thr His Asp Ile
85 90 95
Cys Pro Ser Arg Asn Tyr Ile Leu Val Cys His Pro His Gly Leu Phe
100 105 110
Ala His Gly Trp Phe Gly His Phe Ala Thr Glu Ala Ser Gly Phe Ser
115 120 125
Lys Ile Phe Pro Gly Ile Thr Pro Tyr Ile Leu Thr Leu Gly Ala Phe
130 135 140
Phe Trp Met Pro Phe Leu Arg Glu Tyr Val Met Ser Thr Gly Ala Cys
145 150 155 160
Ser Val Ser Arg Ser Ser Ile Asp Phe Leu Leu Thr His Lys Gly Thr
165 170 175
Gly Asn Met Val Ile Val Val Ile Gly Gly Leu Ala Glu Cys Arg Tyr
180 185 190
Ser Leu Pro Gly Ser Ser Thr Leu Val Leu Lys Asn Arg Ser Gly Phe
195 200 205
Val Arg Met Ala Leu Gln His Gly Val Pro Leu Ile Pro Ala Tyr Ala
210 215 220
Phe Gly Glu Thr Asp Leu Tyr Asp Gln His Ile Phe Thr Pro Gly Gly
225 230 235 240
Phe Val Asn Arg Phe Gln Lys Trp Phe Gln Ser Met Val His Ile Tyr
245 250 255
Pro Cys Ala Phe Tyr Gly Arg Gly Phe Thr Lys Asn Ser Trp Gly Leu

260	265	270
Leu Pro Tyr Ser Arg Pro Val Thr Thr Ile Val Gly Glu Pro Leu Pro		
275	280	285
Met Pro Lys Ile Glu Asn Pro Ser Gln Glu Ile Val Ala Lys Tyr His		
290	295	300
Thr Leu Tyr Ile Asp Ala Leu Arg Lys Leu Phe Asp Gln His Lys Thr		
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<210> 15

<211> 1050

<212> DNA

<213> Homo sapiens

<400> 15

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gcggcgttcc accccatgg agtcctggca gtcggagcct ttgccaacct gtgcactgag	420
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aagccatcg aggtacagaa gacgctgcat ccctcggagg aggaggtgaa ccagctgcac	960
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<210> 16

<211> 333

<212> PRT

<213> Homo sapiens

<400> 16

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20	25	30	
Ile Cys Thr Val Gly Phe Ile Ala Leu Leu Phe Thr Arg Phe Trp Leu			
35	40	45	
Leu Thr Val Leu Tyr Ala Ala Trp Trp Tyr Leu Asp Arg Asp Lys Pro			
50	55	60	
Arg Gln Gly Gly Arg His Ile Gln Ala Ile Arg Cys Trp Thr Ile Trp			
65	70	75	80

<210> 17

<211> 10

<212> PRT

<213> Artificial Sequence

<220>

<223> synthetic peptide

<400> 17

Met Gly Asp Tyr Lys Asp Asp Asp Asp Gly
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<210> 18

<211> 1233

<212> DNA

<213> Homo sapiens

<400> 18

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